European Commission

JRC SCIENTIFIC AND POLICY REPORTS

Report on Innovative Financial Instruments for the Implementation of the SET Plan, First-Of-A-Kind projects

2013

Authors: J. Burnham, O. Debande, O. Jones, C. Mihai, J. Moore, I. Temperton

JRC Coordination: J. Carlsson

Report EUR 26058 EN

Joint Research Centre

European Commission

Joint Research Centre

Institute for Energy and Transport

Contact information

Johan Carlsson

Address: Joint Research Centre, Westerduinweg 3, 1755 LE, The Netherlands

E-mail: johan.carlsson@ec.europa.eu

Tel.: +31 224 565341

Fax: +31 224 565616

http://iet.jrc.ec.europa.eu/

http://www.jrc.ec.europa.eu/

JRC83675

EUR 26058 EN

ISBN 978-92-79-32366-9 (pdf)

ISSN 1831-9424 (online)

doi:10.2790/89984

Luxembourg: Publications Office of the European Union, 2013

Table of contents

Acknowledgements

We gratefully acknowledge the following list of authors, reviewers and contributors to this report.

Financial experts

O. Debande	European Investment Bank
J. Moore	World Bank Consultant
I. Temperton	Climate Change Capital
O. Jones and C. Mihai	Insurance Europe
J. Burnham	The European Private Equity and Venture Capital Association

Representatives from European Industrial Initiatives and Fuel Cells and Hydrogen JU

Solar	G. Arogstinelli (EPIA), I-T Theologitis (EPIA), E. Dufour (ESTELA), F. Klein (Abengoa), C.J. Herrera Casquete de Prado
Bioenergy	A. Lau Tuxen (Novozymes), C. Milan Chacartegui (Abengoa), C. Degano (Chemtex), M. Jonsson (Chemrec)
Wind	N. Stephen (House of Lords), L. Paris Bajos (GAMESA), A. Mac Askill (Mac Askill Associates), J. Barry (Vestas), F. Gagliardi (EWEA)
Smart grids	C. Ivanov (ENTSO-E), M. Paun (ENTSO-E), J. Knigge (EDSO-SG)
Nuclear fission	O. Van der Borgh (SCK-CEN), U. Minopoli (Ansaldo), S. Amico Roxas (ENEA), M. Lecomte (NucAdisor representing CEA), N. Witzanyova (REZ), L. Zezula (REZ), P. Liska (VUJE), M. Pecanka and M. Carulli (LGI Consulting)
Fuel cells and hydrogen	B. De Colvenaer (FCH JU), N. Brahy (FCH JU), L. Tonnellier (Air Liquide), D. Hayter (Intelligent Energy)

European Commission staff

Rapporteur	J. Carlsson (JRC)
Project leaders	A. Mercier (RTD), M. Koch (RTD), C. Thevenot (RTD)

Executive Summary

The implementation of the Strategic Energy Technology Plan is a key priority for the EU. First-Of-A-Kind demonstration projects are essential to demonstrate the technical and commercial viability of these new energy technologies, but until now a key bottleneck has been access to risk finance.

At hearings held with the European Industrial Initiatives[1] and the Fuel Cells Joint Undertaking in March 2013, the total investment needs for First-Of-A-Kind demonstration projects until 2020 were estimated to be between EUR 15-35 billion. The main barriers for raising finance for First-Of-A-Kind demonstration projects were identified as: (1) the high risk nature of the First-Of-A-Kind projects; (2) the lack of supporting policy and regulatory frameworks that would allow to build a commercially viable business case; (3) the lack of coordination and complementarity between financing instruments from EU, Member States, and technology promoters, (4) the lack of financial and technical advice to technology developers and investors, respectively.

The scope of this study is to better understand the financing problem and to provide recommendations on how new financial instruments or modified existing ones can be used for more efficient implementation of the SET Plan. The study concludes that 1) a supportive regulatory framework for SET Plan technologies is a prerequisite for large scale implementation of First-Of-A-Kind demonstration projects, since it would improve the bankability of projects and thereby reduce the risk level for investors; 2) a new dedicated financial instrument at EU level is not needed since the existing toolbox already provide equity, loans, or guarantees for eligible First-Of-A-Kind projects.

It is recognised that existing instruments have not provided the financing required for the deployment of all new energy technologies due to the high risk level or large size of the projects. The solution to this issue must be a shared public-private effort. The study found that there is a need for clearer planning and commitment from industry regarding these first of a kind demonstration projects if public support from the EU and Member States are to be provided. Credible mobilisation of private capital is necessary and prioritisation among projects by industry participants to avoid that scarce public and private sector resources are spread too thinly.

As the EU response to improve access to financing, implementation of the following changes are recommended:

1. **Enhanced risk sharing for financing at EU level through a dedicated facility providing risk finance for the SET Plan.** Such a facility should have the following key features:

1 Solar, wind, bioenergy, nuclear fission, smart grids, carbon capture and storage (not represented at hearing).

- **EU budget for risk taking**
- **Significant contribution from project promoters**
- **Contribution from Member States for risk taking to achieve critical mass**

The EU would provide budgetary resources to such a dedicated facility (SET Plan facility). The financial contribution from the SET Plan facility would reduce the risk level for other investors, thereby facilitating mobilization of private risk finance (leveraging of the EU budget resources). Ideally, the facility would be ring-fenced to support the financing of First-Of-A-Kind SET Plan technology projects. The facility could mobilise up to 50% of the financing for an individual project.

EU Member States could contribute to the risk-taking capacity of the facility by matching EU budgetary resources, thus helping to achieve critical mass and thereby underlining their commitment to implementing the SET Plan. Ideally, Member States would contribute directly to the facility, and then its resources would be used EU-wide according to the rules of the facility to be defined and agreed together with Members States.

Project promoters would need to finance from their own resources a minimum of 25%[2] of the First-Of-A-Kind demonstrator costs themselves, in order to ensure that the project will be supported with sufficient resources and demonstrate their own commitment to higher-risk projects.

2. **<u>Promoting a financing package</u>**

   - **Increased coordination between existing risk sharing instruments at EU level in order to offer an integrated financing package to technology developers**
   - **Conditionality in the use of EU grants as part of financing package for SET Plan projects which should be disbursed only if the other components of the financing plan are in place**

3. **<u>Improving financing readiness of projects</u>**

   - **Establish a rating methodology for SET Plan projects in order to increase transparency and reduce actual and perceived investment risk for investors.**
   - **Provide financial and technical advice to project promoters and investors, respectively, to improve the investment readiness of projects**

2 There is disagreement among the experts what the minimum level should be, i.e. from not being specified and up to 50%.

- **Promote greater industry co-ordination and mobilisation of industry-wide resources, so that these large capital projects clearly have the financial and industry resources to succeed**

The proposed financing measures should be part of the upcoming Action Plan as proposed in the Communication on Energy Technologies and Innovation[3].

3 Commission Directive 2013/253 of 2 May 2013 concerning Energy Technologies and Innovation

1 Background and motivation

Meeting the EU energy goals for 2050 will require continuous development and commercialisation of new generations of low carbon energy technologies and systems. Only technologies that stand a better chance of competing with conventional energy in the long run and that are radically ahead of the state-of-the-art have the potential to ensure a global industrial leadership.

First-Of-A-Kind commercial demonstration projects are essential to demonstrate the technical and commercial viability at industrial scale of new generations of energy technologies and solutions to achieve a cost-competitive, sustainable and secure energy sector by 2050. These actions are predominant in the Strategic Energy Technology (SET) Plan roadmaps.

Among the key barriers to implement First-Of-A-Kind demonstration projects are policy and regulatory uncertainties. Without stable and predictable policy framework conditions on the demand side (such as directives and feed-in tariffs), it is often difficult to encourage investment and to build a commercially viable business case. A second major obstacle is the lack of finance for high risk/return First-Of-A-Kind demonstration projects due to their pre-commercial development stage and unproven technologies at industrial scale. Such projects are usually too risky for commercial finance and therefore considered as "not bankable".

In order to better understand the financing problem and to provide possible solutions to it, Commissioners Öttinger and Geoghegan-Quinn, in 2012, requested an expert report, on existing and new financial instruments which could be used for the implementation of the SET Plan. Financial instruments are defined by the Financial Regulation as a broad range of non-grant interventions such as loans, guarantees, equity investments, quasi-equity investment and risk-sharing instruments such as credit enhancements for project bonds in the form of a loan or a guarantee. Financial instruments need to demonstrate that they can leverage EU budget with additional funding from private and other sources. They are best suited in areas where projects have revenue-generating capacity.

The report focuses on the financing of First-Of-A-Kind demonstration projects with technology readiness level of 7/8[4], i.e. demonstration in operational environment and systems complete and validated. It contains a comprehensive analysis leading to concrete recommendations to facilitate access to finance for these kinds of projects. These recommendations cover options for

4 United States Department of Energy, "Technology Readiness Assessment Guide (DOE G 413.3-4)", Office of Management. October 12, 2009.

modifying/expanding existing instruments/facilities and options for new financial instruments/facilities as well as in terms of combinations of instruments and financing structures for the projects.

Concept and methodology

This report is based on the work of an expert group composed of representatives of the following financial organisations:

- The European Investment Bank
- The European Venture Capital Association
- The European Insurance and Re-insurance federation
- The World Bank (for issues related to green bonds)
- Climate Change Capital

The starting point for this report was the research and innovation agenda of the SET Plan European Industrial Initiatives (EIIs) and the Fuel Cells and Hydrogen Joint Undertaking (FCH JU). The energy technologies considered in this report are: wind, photovoltaic, concentrating solar power, electricity grids, bioenergy, carbon capture and storage, hydrogen and fuel cells and nuclear fission.

A key element to support the analysis was the organisation of six hearings with key stakeholders representing the SET Plan EIIs and the FCH JU. These hearings enabled in-depth discussions regarding the needs for launching First-Of-A-Kind demonstration projects for the different sectors, the main barriers for their implementation and the gaps as regard access to finance. Minutes of the hearings can be found on the SETIS website[5].

Several services from the EC have been involved in this exercise, namely DG RTD, DG ENER, DG JRC, DG ECFIN, DG REGIO and DG CLIMA. JRC/SETIS acted as rapporteur.

In making this analysis, attention has been paid to ensure added-value and complementarities with the SET Plan initiatives as well as with the other EU frameworks on energy and access to risk finance.

Boundary conditions

5 http://setis.ec.europa.eu/setis-deliverables/setis-workshops-hearings/summaries-based-hearings-european-industrial-initiatives

This document provides a robust analysis of the possibility for financing instruments geared to the breakthrough nature of the SET Plan projects, based on the best available information today. This exercise covers the financing engineering aspects and not the regulatory/market framework.

2 Estimated investment needs

Investment needs for First-Of-A-Kind commercial demonstration projects in the sectors covered by this report have been roughly estimated at about EUR 15 to 35 billion up to 2020, with the exception of nuclear and smart grids projects that extend to 2030. Investments per sectors are detailed in Table 1 below. These estimates are based on the SET Plan implementation plans and roadmaps and derived from the Hearings with representatives from the EIIs on wind, solar, bioenergy, smart grids, nuclear fission, carbon capture and storage[6], and the FCH JU held on 25-27 March 2013[7].

Table 1. Estimated Investment needs.

Solar PV	*Average project total cost:* EUR 10 to 100 million for utility scale (MW's) generation projects EUR 50 to 250 million for manufacturing projects *Financing needs up to 2020:* about EUR 0.5 to 3 billion (about 5 to 10 projects).
Solar CSP	Focus on R&D pilots for innovative components in the short term.
Wind	*Average project total cost:* EUR 100 to 300 million for off-shore wind farm projects (10 – 20 turbines of 5 -8 MW+ scale) EUR 300 million for manufacturing projects *Financing needs up to 2020:* about EUR 2 to 5 billion (5 to 10 projects).
Bioenergy	*Average project total cost*: EUR 180-600 million for bio-refinery projects in the coming three years *Financing needs up to 2020*: EUR 5 to 10 billion (about 10 to 20 projects)
Smart grids[8]	*Average project total cost:* EUR 10s million for industrialisation of innovative solutions EUR 1 to 10s billion for large scale deployment project Financing needs up to 2030 for industrialisation: EUR 0.5 to 1 billion
Nuclear	*Average project total cost:* EUR 1.0 billion for ADS MYRRHA concept (start 2023) EUR 4.3 billion for SFR ASTRID concept (start 2025) EUR 1.4 billion for LFR ALFRED concept (start beyond 2025)

6 Information from questionnaire. Did not participate in hearing.

7 The full summaries of the hearings can be found on the SETIS website. http://setis.ec.europa.eu/setis-deliverables/setis-workshops-hearings/summaries-based-hearings-european-industrial-initiatives

8 EEIG, 2013, Cost estimates derive from 'European Electricity Grid Initiative Research and Innovation Roadmap 2013-2022

	EUR 1 billion for GFR ALLEGRO (start 2030) *Financing needs up to 2030:* about EUR 5 to 10 billion
Fuel cells and hydrogen[9]	*Financing needs for demonstrations:* about EUR 3 billion, of which: EUR 2 billion for transport and refuelling EUR 0.5 billion for production EUR 0.15 billion for stationary fuel cell systems EUR 0.2 billion for early markets
CCS[10]	*Average project total cost:* EUR 600-1000 million per carbon capture and storage project *Financing needs:* EUR 5 to 10 billion

9 It is noted that efforts for market introduction has been estimated at EUR 11.5 billion, of which EUR 9.5 billion for transport and refuelling, EUR 1 billion for production, EUR 0.7 billion for stationary, EUR 0.5 billion for early markets

10 Source: No dedicated hearing took place. Cost estimates derive from Questionnaire from the CCS community and the report 'EU Demonstration Programme for CO_2 Capture and Storage (CCS) ZEP's Proposal' November 2008

3 Analysis of existing financial instruments, and of the barriers and needs experienced by technology developers

3.1 The current financial instruments potentially applicable to First-Of-A-Kind commercial demonstration projects at EU and international level

Several instruments and/or facilities have been launched in the EU in recent years to support investments in the field of energy (loans, equity, and guarantees). The experts studied existing instruments and facilities both at EU and international level, and analysed their applicability towards First-Of-A-Kind SET Plan commercial demonstration projects. The findings are listed in Tables 2 and 3. More comprehensive information can be found in Annex 1.

Table 2. Existing European financial instruments related to energy investments and their applicability for First-Of-A-Kind SET Plan demonstration projects.

Instruments	Organisation	Main Characteristics	Suitable for First-Of-A-Kind SET Plan Projects
Loans and Guarantees	European Investment Bank (EIB)	Standard or RDI investment loans - Direct loans for corporates or Single Purpose Vehicles (SPV) supporting projects in knowledge economy where the total cost is over EUR 25 million (covering up to 50% of the total cost).	Yes in principle, but limited to moderate risk levels
		Intermediated loans - Intermediated loans to local, regional and national banks supporting investment projects by SMEs and Mid-caps for which the total cost is below EUR 25 million	Limited
		Guarantees - For large and small projects to make them more attractive to other investors. Guarantees for senior and subordinated debt, either in a standard form or as a debt service guarantee similar to that offered by monoline insurers.	Limited
	Joint European Commission/ European Investment Bank (EIB)	Project bonds Initiative - The instrument provides subordinated facilities (either in the form of a loan or a contingent facility) to bonds issued by infrastructure project companies. The instrument in its pilot phase can provide guarantees of EUR 690 million across the three sectors, of which EUR 600 million in transport networks, EUR 60 million for Broadband and EUR 30 million for energy networks.	No, because focus is on commercially proven projects

		Risk Sharing Financing Facility - Financed direct or intermediated Research Development and Innovation projects undertaken by low or sub investment grade companies, universities or SPV. Financed 13 solar and wind projects during 2007-2011 for a loan amount of EUR 1.4 billion.	Yes in principle, but within given risk limits
		Connecting Europe Facility - The Connecting Europe Facility (CEF) is the proposed instrument for funding investment in Europe's transport, energy and digital networks infrastructure, i.e. not energy production. The latest budgetary proposal for the CEF is EUR 29 billion over the seven year period 2014-2020. The majority of CEF will be delivered in the form of grants, however up to 10% of the programme could be delivered in the form of financial instruments.	Limited
		EURATOM loans - can be granted for financing of investments projects in nuclear installations. Applicable for nuclear facilities generating electricity or are part of the nuclear fuel cycle. Loan can finance up to 20% of total budget of project. Borrowing ceiling is EUR 4 billion, but almost fully used (around EUR 300 Euro available in July 2013).	Limited to nuclear fission
	European Bank for Reconstruction and Development (EBRD)	EBRD provides project financing for banks, industries and businesses, both new ventures and investments in existing companies. The principal forms of direct financing that may be provided by the EBRD are loans (up to EUR 5 million), equity (up to EUR 2 million) and guarantees. The Bank has developed a Sustainable Energy Initiative (SEI) to scale up and accelerate investment in climate change mitigation and energy efficiency projects in the countries of operations. Since 2006 EUR 10 billion was invested by the SEI.	Limited to Central and Eastern Europe and with moderate risk level only
Equity	Marguerite fund	Long term equity fund targeting primarily greenfield transport and energy infrastructure at pre-construction and construction phase. The Marguerite Fund has secured commitments of EUR 710 million from its sponsors including EUR 80 million from the European Commission. To date circa EUR 280 million has been allocated to the eight signed projects.	Very limited; financing usually only available for commercially viable projects
	Venture capital	Venture capital funds generally invest relatively small amounts of equity capital in companies. These investments tend to be in companies in their start-up or expansion phase that may also require access to managerial expertise and networks. Venture capital funds do not invest in infrastructure.	No, investments amounts too low
Insurance/re-insurance products		Insurance products can be used in certain limited circumstances to reduce project risks and so enhance investability. However, this is primarily applicable for risks with significant statistical data	Very limited in terms of risk taking. Potentially

		available, where risk can be priced. Therefore (re)insurance products are highly probable not suited to support First-Of-A-Kind projects.	as a long term investor.

In addition the experts looked at existing instruments/facilities potentially applicable for First-Of-A-Kind demonstration projects at international level and their accessibility for European projects.

Table 3. Existing international financial instruments supporting investment in First-Of-A-Kind SET Plan demonstration projects.

Instruments	Organisation	Main Characteristics	Suitable for First-Of-A-Kind SET Plan Projects
Loans and Guarantees	United States Department Of Energy loan programme	US DOE has 3 loan programs to spur investment in the same new technology sectors that the SET plan targets. Up to 80% of the loan can be assumed or guaranteed through these programs. The loans are administered through financial intermediaries. Interest rates are determined by the cost to the US Treasury (AA) of incurring debt at the time of issuance.	Yes in principle, but not accessible for European projects
	IFC	IFC financial products include loans, guarantees, equity investments, and risk-sharing and venture capital funds. The IFC is committed to working with its European partners and shareholders, although the EU is not a focus area for IFC investment and advisory services. The financial products available are loans (up to USD 100 million), syndicated loans, equity finance (up to 20% stake) etc. In addition there are the CleanTech Innovation Facility and the Cleantech Venture Capital Fund. Cleantech eligible sectors are those that are included in the SET Plan (excluding nuclear).	Yes in principle, although moderate risk levels. Not accessible to nuclear. Limited to Eastern Europe.
	World Bank – Climate investments funds and climate technology fund	The Climate Investment Funds is a multi-donor platform governed by a separate (from the WB) oversight structure. The funds are disbursed as grants, highly concessional loans, and/or risk mitigation instruments. The eligible sectors are renewable energy, sustainable transport, and energy efficiency. Although Eastern Europe is included among the eligible recipient regions, there are no EU member countries on the list of potential recipients.	Not applicable
	Asian Development bank (ADB)	Partial credit guarantees of principal in favour of foreign and local commercial banks lending to solar power generation projects in India. Eligible projects implemented by SPV, incorporated in India, to develop, construct, commission and operate solar power generation projects.	Yes in principle, but not accessible for European projects

Green Bonds	World Bank	The World Bank has issued about USD 3.5 billion in Green Bonds in 17 different currencies. Eligible projects include mitigation activities that fall in the same sectors/subsectors as the SET Plan activities (not nuclear). Eligible countries for the underlying projects are IBRD borrowing countries, which include some EU member countries.	Yes, in principle, but must be financially viable.

Although it is outside the scope of this report, it is noted that public support in the form of grants plays an important role in de-risking very innovative and risky projects and that they can leverage significant private capital. For instance, the EU launched two major initiatives in 2009 and 2011 that contributed to the financing of First-Of-A-Kind projects, namely:

- *European Energy Programme for Recovery (EEPR)* provides financial support to selected highly strategic projects in the energy sectors. Among the objectives of EEPR are to make energy supplies more reliable, to reduce greenhouse gas emissions, and boost Europe's economic recovery. The EEPR was launched in 2009. Grants totalling EUR 4 billion had been made available, of which EUR 565 million to Offshore wind, EUR 392 million to CCS.
- *The NER300 programme* is one of the main sources for SET Plan funding. The programme, established under article 10a(8) of the EU Emissions Trading Directive, is to cover 300 million allowances from the New Entrants Reserve of the EU Emission Trading System for the co-financing of commercial scale demonstration projects in CCS and innovative renewable energy technologies. The first call for proposals, covering the revenues of the sale of 200 million allowances, awarded EUR 1.2 billion was awarded to 23 innovative renewable energy projects. The Commission aims to make the award decision under the second call for proposals, covering the sale of the remaining 100 million allowances and unused funds from the first call by mid 2014.

Lessons from the EEPR are mixed. While for the innovative offshore wind technology projects EEPR grants managed to mobilise additional capital, for CCS, this was not the case, notably due to that industry not being ready, the absence of favourable market conditions (low carbon emission rights prices), and a regulatory framework which would have allowed building a business case. The EEPR in CCS particularly illustrates the lack of co-ordination and mobilisation of private sector resources which was apparent in this study.

For the NER300 programme first call, the NER300 funding of EUR 1.2 billion leveraged private funding of EUR 2 billion and additional support at Member State level (EUR 1.4 billion) provided via operational benefits. Projects are expected to entry into operation at the latest by end of 2016.

3.2 Key barriers and needs expressed by the industrial initiatives

Key barriers and needs as well as proposals for new financial instruments expressed at the hearings by the EIIs and the FCH JU are summarized in Table 4. It has to be noted that the authors of the report do not necessarily endorse all the findings presented below. Detailed summaries from the hearings can be found on the SETIS website[11].

Table 4. Key barriers and needs expressed by the industrial initiatives.

Wind	Needs: Corporate or multilateral support/guarantees and grants Barriers: Expensive long term financing. Risk aversion of banks. New instruments: No new instruments required
Solar PV and CSP	Needs: Soft loans, grants, and loan guarantees. Mezzanine loans for manufacturing industry. Supportive regulatory framework. Barriers: Long term bank finance for new technology rare. New instruments: No new instruments required.
Bioenergy	Needs: Grants, sub-ordinate debt, loan guarantees or equity instruments. Greater risk appetite of existing instruments. Supportive regulatory framework. Barriers: Demand side and policy uncertainty. New instruments: No new instruments required.
Smart grids	Needs: Standardisation to achieve interoperability of new equipments. Strong political commitment. Barriers: No viable market model today. Implementation of proper regulatory frameworks delayed. New instruments: No new instruments required.
Nuclear	Needs: Grants, structural funds, adopted loan criteria, loan guarantees, and EURATOM or EIB loans. Strong public financial support. Barriers: Limitations of Euratom loans. RSFF and ERIC (incl. tax exemption) unavailable for research infrastructure under present rules and regulations. Structuration of debt for R&D type facilities. New instruments: Need for risk sharing finance and ERIC to be open to nuclear projects under new rules and regulations.
Fuel cells and hydrogen	Needs: Reimbursable grants, government grants, private equity. Barriers: Large investment needed to build hydrogen filling network. Industrial players not willing to take the risk alone. New instruments: Reimbursable grants with long grace period

11 http://setis.ec.europa.eu/setis-deliverables/setis-workshops-hearings/summaries-based-hearings-european-industrial-initiatives

CCS[12]	Needs: Significant upfront financing to cover costs for installation. This is needed for both capture and storage projects. Barriers: Significant volume for projects with business plans highly dependent on energy price evolution. Public acceptance of on-shore storage facilities. Funding gaps in private and/or public contribution. New instruments: No new instruments required.

3.3 Analysis of barriers

As explained in Section 1, First-Of-A-Kind projects have specific characteristics making the financial structuring of this project complex:

- Long maturity of the project: in addition to the significant time to the market for the deployment of this kind of project, some sectors such as fuel cell and hydrogen, the nuclear sector will only generate stable cash-flows during operation in the medium-term well beyond the usual grace period provided by banks. This exacerbates the fact that the availability of commercial bank loans with tenors longer than 5 years has sharply deteriorated, creating a gap between the project life and available loan maturity.
- Discontinuity in the size of the investment: despite the validation of the technology at demonstration level, the market deployment of the new technologies requires a sizable investment entailing some technological risks to demonstrate their viability. For instance in the wind sector, First-Of-A-Kind projects should be large enough to kick start investment in the supply chain required for new large turbines in the 5-8 MW range

12 Information based on Questionnaire for CCS community. The CCS community was not represented at hearing.

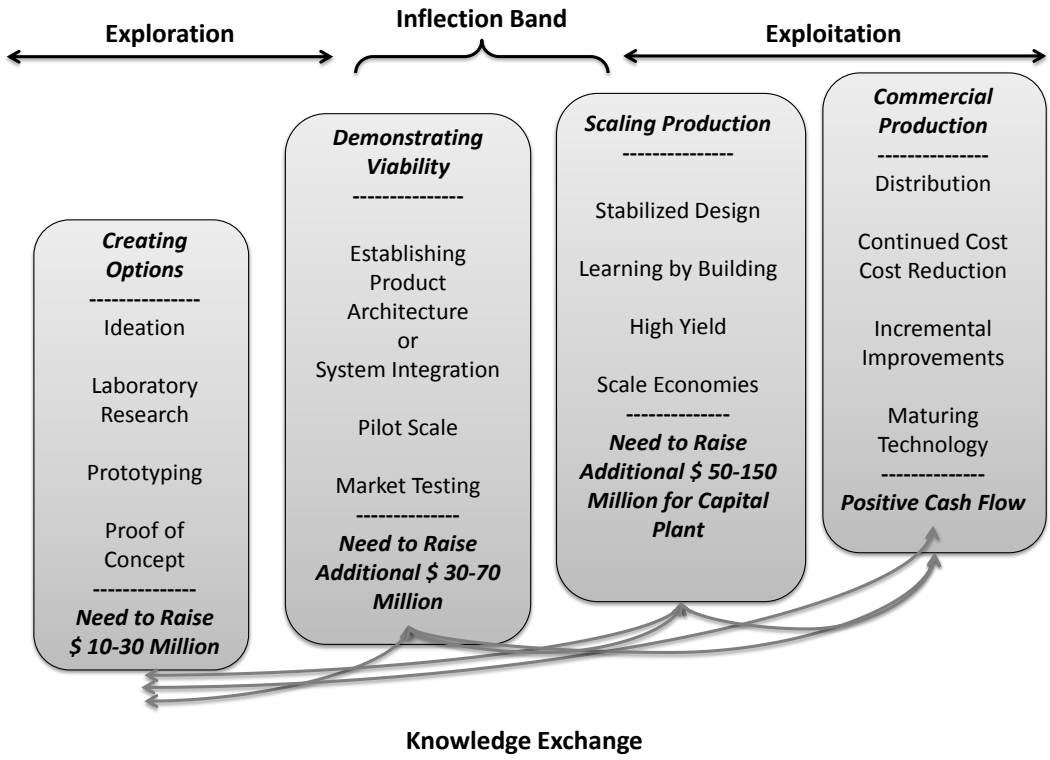

Figure 1, First-Of-A-Kind discontinuity[13]

In addition to these peculiarities of the First-Of-A-Kind demonstration projects, various barriers prevent access to appropriate funding sources.

First of all, there is a lack of stable and predictable regulatory framework conditions, notably support schemes which have a negatively impact on the First-Of-A-Kind capacity to generate a stable flow of revenues during operation. Recent revision of feed-in tariffs for renewables in several Member States (e.g. Concentrated Solar Power) or the collapse of the CO_2 emission allowance prices increase the cost of innovative technologies compared to conventional fossil fuels and operating nuclear plants. The stability of returns is a key ingredient to improve the bankability of projects. The public debt sustainability constraint faced by various European countries which are natural candidates for the deployment of some First-Of-A-Kind demonstration projects due to their natural and geological characteristics contributes to the current uncertainty.

13 Adapted from Figure 2.1, "The four stages of energy innovation," page 11, in Richard K. Lester and David M. Hart, Unlocking Energy Innovation: How America Can Build a Low-Cost, Low-Carbon Energy System (Cambridge, Massachusetts; London, England: The MIT Press, 2011).

Secondly, the deleveraging process as well as the new regulatory constraints faced by banks[14] reduces the available liquidity and the thickness of the syndication market as well as deteriorates the loans conditions offered to potential borrowers both for project and corporate finance. This is happening while the European financing market remains largely dependent on commercial banks for up to 80% of debt funding. The long-term nature of most energy First-Of-A-Kind matches the profile of the long term institutional investors and national or international development banks, but not their risk appetite. Due to their pre-commercial nature and unproven technologies, they are usually too risky for market-based finance and hence considered as 'not bankable'.

Thirdly, the lack of an adequate business model and insufficient market demand prevent the deployment of some energy technologies, such as smart grids or fuel cells and hydrogen.

Fourthly, structuring First-Of-A-Kind projects, either as a corporate loan or through project finance, requires considerable know-how and skills to assess and allocate the risks properly. In addition to the complexity of constructing large-scale facilities, there are numerous associated risks to be assessed, including the project's delivery methods, the capacity of contractors and the manner in which the project's contractual documentation distributes risks between suppliers and contractors in order to have a fair alignment of interests. Commercial banks and international financial institutions such as the EIB play a key role in the provision of this kind of services. In general, institutional investors do not have the internal expertise and are not adequately equipped to address these risks, which compound their difficulty in providing funding.

In addition, First-Of-A-Kind SET Plan demonstration projects are usually too capital-intensive for venture capital investment and too risky for private equity financing. The novelty of technologies and the lack of historical data also prevent the insurance industry to design products which could contribute to the de-risking of First-Of-A-Kind demonstration projects.

3.2.1 Gaps of existing instruments

Despite the availability of various funding instruments as summarized in Section 3.1 and according to the industry hearings, gaps remain in terms of financial tools regarding:

- The availability of adequate regulatory support and grant funding to de-risk projects in order to make them bankable. It includes for instance the existence of stable feed-in tariff or

14 Banking regulations requiring commercial banks to hold additional capital reserves for longer-term loans have resulted in banks lending relatively small amounts and for shorter duration.

renewable purchase obligations through which a minimum amount of electricity must be purchased from clean energy sources by power distribution companies.

- The availability of appropriate debt financing due to increased risk aversion and reduced tenors of commercial banks, as a result of increasing regulatory constraints combined with insufficient interest of non-bank debt providers.
- Insufficient equity commitment by technology developers is not ensuring alignment of interests. Lack of co-ordination and mobilisation of private sector resources towards First-Of-A-Kind demonstration projects.
- The availability of credit-enhancement mechanism in order to improve the risk profile of the project to make it attractive for institutional investors having a lower risk tolerance.

In addition, funding of First-Of-A-Kind demonstration projects could be accelerated through better standardisation of the due diligence process, the dissemination of expertise, the exchange of best practice experiences and technological spill-overs between successfully implemented projects. The limited exchange of information can be partially explained by the fact that private companies have little interest in disseminating the acquired knowledge that gives them a competitive edge.

4 Main findings and recommendations

4.1 Main findings

1. A prerequisite for investing in or lending to First-Of-A-Kind demonstrators is the existence of market conditions generating stable long term revenues. Isolated financial instruments could eventually de-risk the financing of a single, stand-alone project to demonstrate the technology (at very high price), but it would fail in providing larger scale introduction of the technology to the market.

2. Technology developers experience difficulties in raising finance from banks. The reasons are manifold: (1) First-Of-A-Kind demonstrators are considered high-risk projects, which in addition are difficult to evaluate (2) commercial banks are more risk-averse under difficult market conditions, and (3) balance sheets of banks are constrained by tightened credit standards reducing their funds available for the medium to long-term market segment.

3. For the SET Plan technologies investigated, it was found that there is no need for new financing instruments at EU level. Existing EU instruments cover already equity, loans and guarantees. However, due to the too high risk level of First-Of-A-Kind projects, they cannot provide sufficient finance.

4. There is a need to consolidate and co-ordinate the industrial part if projects are to succeed. Projects need to be structured to best utilise scarce public and private resources.

5. To finance a portfolio of SET Plan projects instead of individual projects could be a solution to achieve risk diversification. All projects to be funded still need to be technically viable and bankable, but their individual risk level with regard to non-repayment can differ. Thereby, higher-risk projects could be levelled out with lower risk projects within a portfolio approach supported by risk-taking capacity, thus allowing also the financing of higher risk projects.

6. Financing challenges are often better addressed at EU level to attain critical mass. It would allow the pooling of private and public resources to develop industrial strategies, to establish supply chains and, risk reduction mechanisms for investors and lenders.

7. There is a need for rationalisation of the number of project proposals in sectors in order to focus efforts on the most promising projects.

8. A strong industrial commitment behind the different First-Of-A-Kind projects is needed. This includes the provision of substantial financial resources from project promoters themselves to underpin their seriousness towards the project.
9. Existing funding instruments at EU level (grants and financial instruments) currently operate in an isolated manner and do not offer a financing package to technology developers. In particular, a precondition for obtaining EU grants should be the existence of a credible and established financing plan for the entire project.
10. There is a need to improve the financing structure of projects.
11. Some private investors and lenders lack the competence to evaluate the risk level of First-Of-A-Kind projects. If they are supported in their evaluation, it could make them more willing to invest/lend.

4.2 Recommendations

A supportive regulatory framework for SET Plan technologies is a prerequisite for the implementation of First-Of-A-Kind demonstration projects, since it would improve the bankability of projects and thereby reduce the risk level for investors. However, the market regulation is outside the scope of this report and therefore not treated further here.

As the EU response, the following changes to existing financial instruments and their utilisation are recommended:

1. Enhanced risk sharing for financing at EU level through a dedicated facility providing risk finance for the SET Plan. Such a facility should have the following key features:

- **EU budget for risk-taking**
- **Significant contribution from project promoters**
- **Contribution from Member State for risk-taking to achieve critical mass**

The EU would provide budgetary resources to a dedicated SET Plan facility. Compared to regular EU grants the SET Plan facility would have the advantage that it allows: (1) leveraging the EU budget, (2) risk-sharing, and (3) better align interests of all stakeholders. The financial contribution from the SET Plan facility would reduce the risk level for investors and lenders, thereby facilitating the mobilization of private risk finance. Ideally, the facility would be ring-fenced to support the financing of First-Of-A-Kind SET Plan technology projects. The facility could mobilise up to 50% of the financing for a single project.

EU Member States could increase the risk-taking capacity through a matching contribution, thus helping to achieve a critical mass. Member States could provide financial support directly to the SET Plan facility. The resources of the facility would be used EU-wide according to the rules to be defined and agreed together with Members States. In the case that Member States are reluctant to pool resources in a SET Plan facility, it could be envisaged as a back-up solution that they fund projects in parallel.

Project promoters would need to finance from their own resources a minimum of 25%[15] of the First-Of-A-Kind demonstrator themselves in order to ensure that the project will be supported with sufficient resources and to demonstrate their own commitment to higher-risk projects.

2. <u>Promoting a financing package</u>

- **Increase coordination between existing risk-sharing instruments at EU level in order to offer an integrated financing package to technology developers.** This should include structural funds.
- **Conditionality in the use of EU grants as part of a financing package which should be disbursed only if the other components of the financing plan are in place.**

3. <u>Improving financing readiness of projects</u>

- **Establish a rating methodology for SET Plan projects in order to increase transparency and reduce perceived investment risk for investors.**
- **Provide technical and financial advice to project promoters and investors, respectively, to improve the investment readiness of projects**

The proposed measures should be part of the upcoming Action Plan as proposed in the Communication on Energy Technologies and Innovation[16].

15 There is disagreement among the experts what the minimum level should be, i.e. from not being specified and up to 50%.

16 Commission Directive 2013/253 of 2 May 2013 concerning Energy Technologies and Innovation

5 Conclusions

The implementation of the SET Plan by 2020 is a key priority for the EU. First-Of-A-Kind demonstration projects are essential to introduce new innovative energy technologies to the market. A key bottleneck for First-Of-A-Kind demonstration projects until now is access to risk finance. This is an issue which must be resolved through a public-private effort. In view of the upcoming Action Plan proposed in the Communication on Energy Technologies and Innovation[17], it is proposed that the above mentioned recommendations for setting –up a dedicated financing facility for the implementation of the SET Plan are incorporated.

17 Commission Directive 2013/253 of 2 May 2013 concerning Energy Technologies and Innovation

Annex 1 – Abbreviations and acronyms

CCS	Carbon Capture and Storage
CEF	Connecting Europe Facility
CSP	Concentrated Solar Power
DOE	Department Of Energy
EBRD	European Bank for Reconstruction and Development
EEPR	European Energy Programme for Recovery
EIB	European Investment Bank
EII	European Industrial Initiative
ERIC	European Research Infrastructure Consortium
FCH JU	Fuel Cells and Hydrogen Joint Undertaking
IBRD	International Bank for Reconstruction and Development
IFC	International Finance Corporation
MFF	Multiannual Financial Framework
RES	Renewable Energy Source
RSFF	Risk Sharing Finance Facility
PV	Photovoltaic
RDI	Research Development and Innovation
SETIS	Strategic Energy Technology Information System
SET Plan	Strategic Energy Technology Plan
SPV	Single Purpose Vehicle

Annex 2 – Financial Instruments

Table 5. European financial instruments with long description.

Instruments	Organisation	Main Characteristics	Suitable for First of a Kind SET Plan Projects
Loans and Guarantees	European Investment Bank (EIB)	Standard or RDI investment loans • Direct investment loans for corporates or Single Purpose Vehicles (SPV) supporting projects in knowledge economy where the total cost is over EUR 25 million (covering up to 50% of the total cost). • Long maturities linked to the economic life of the underlying assets. • Applicable to most of SET plan sub-sectors.	Yes in principle, but limited to moderate risk levels
		<u>Intermediated loans</u> • Intermediated loans to local, regional and national banks supporting investment projects by SMEs and Mid-caps for which the total cost is below EUR 25 million • Lending decision for such EIB loans remains with the financial intermediary. Applicable to most of the SET plan sub-sectors.	Limited
		<u>Guarantees</u> • Large and small projects to make them more attractive to other investors • Guarantees for senior and subordinated debt, either in a standard form or as a debt service guarantee similar to that offered by monoline insurers • Beneficiaries can be large private and public projects or partner financial intermediaries providing SME financing. Applicable to most of the SET plan sub-sectors.	Limited
	Joint European Commission/ European Investment Bank	<u>EU project bonds (pilot phase)</u> The Project Bond Initiative is a financial instrument established in order to facilitate debt capital market financing of infrastructure projects in the fields of Trans European Networks – Transport, Trans European Networks – Energy and Broadband networks. The instrument provides subordinated facilities (either in the form of a loan or a contingent facility) to bonds issued by infrastructure project companies. The improved credit quality of the bonds is expected to facilitate their placement with institutional investors and therefore widen financing options for	No, because focus is on commercially proven projects

		infrastructure projects in terms of margin and tenor compared to terms currently available with project finance senior debt. The initiative – which is a pilot phase ahead of the more widespread deployment of the Connecting Europe Facility - was launched in November 2012 and a first deal is expected to be announced in the course of 2013. <u>Size</u> The instrument can provide guarantees of EUR 690 million across the three sectors, of which EUR 600 million in transport networks, EUR 60 million for Broadband and EUR 30 million for energy networks. <u>First-Of-A-Kind SET Plan technologies that could be financed</u> The Project Bond Initiative cannot be used to finance First-Of-A-Kind SET- Plan projects mainly for two reasons: 1) Project bonds are the debt capital market equivalent to project finance senior loans. Investors buy project bonds on a commercial basis and they expect to be repaid both the principal and interest that covers their risk. Investors will only fund "bankable" projects, i.e. projects that generate sufficient revenues and can demonstrate a secure cash flow stream over their lifetime. Investors in project bonds can accept certain risks but are not willing to expose themselves to technology risk. 2) The instrument is sector-specific and energy generation projects such as those that are part of the SET Plan are not eligible.	
		<u>Risk Sharing Financing Facility</u> - Direct or intermediated RDI projects undertaken by low or sub investment grade companies, universities or SPV. See RDI investment loans for other characteristics of the financial product.	Yes in principle, but within given risk limits
		<u>Connecting Europe Facility</u> The Connecting Europe Facility (CEF), is the proposed instrument for funding investment in Europe's transport, energy and digital networks infrastructure. It will focus on financing projects which fill the missing links in Europe's energy, transport and digital backbone. CEF is the main tool for infrastructure investment in the proposed Multiannual Financial Framework (MFF) for the seven year period 2014 -2020. CEF will provide financial support projects included in the guidelines for Trans European Network – Transport and Trans European Network – Energy as well as projects of common interest in the broadband sector.	Limited

		The majority of CEF will be delivered in the form of grants, however up to 10% of the programme could be delivered in the form of financial instruments. The envisaged instruments include debt instruments (loans, loan guarantees as well as credit enhancement of project bonds) and equity instruments (investment in risk capital structures supporting investment in infrastructure). <u>Size</u> Both the budget of the Connecting Europe Facility and the details of its implementation are currently under discussion in the Council and Parliament. The latest budgetary proposal for the CEF is EUR 29 billion over the seven year period 2014-2020. It is still unclear what share of the budget would be allocated to financial instruments. <u>Technologies that could be financed</u> Most of the SET Plan EIIs focus on energy production which is not an eligible sector within the CEF programme. The electricity grids EII could potentially benefit from CEF financial instruments if the projects are considered projects of common interest (PCI) and are part of the list of projects within the Trans European Network – Energy guidelines. If that were the case, the most appropriate financial instrument could be a loan guarantee instrument based on the Risk Sharing Finance Facility (RSFF). The EU budget would provide guarantee to a financial intermediary covering a certain level of risk on loans that it would provide to companies. With this guarantee the financial intermediary would then be able to provide loans at better terms to more companies, including ones without less solid business cases. The electricity grid First-Of-A-Kind projects could then potentially obtain such loans. However this would still require that the projects demonstrate a revenue generating capacity, proving they can repay the loan.	
		<u>EURATOM loans</u> Can be grated for financing of investments projects in nuclear installations generating electricity or are part of the nuclear fuel cycle. Loan can finance up to 20% of total budget of project. <u>Size</u> Borrowing ceiling is EUR 4 billion, but only limited amount is left (about EUR 300 million) before ceiling is reached. <u>Technologies that can be financed</u> Nuclear fission	Limited to nuclear fission

	European Bank for Reconstruction and Development	Loans: (i) *Loans for larger projects* from EUR 5 million - EUR 250 million. The average amount is EUR 25 million. The credit risk can be taken entirely by the Bank or may be partly syndicated to the market. (ii) *Loans for smaller projects* through support to local commercial banks, which in turn provide loans to SMEs and municipalities. Tools that may be available include credit lines, bank-to-bank loans, standby credit facilities and equity investments in the local banks. Equity investments: The investment equity ranges from EUR 2 million - EUR 100 million in industry, infrastructure, and the financial sector. The EBRD also participates in investment funds, which in turn invest in medium-sized companies that need to expand their business. Equity funds are focused on a specific region, country or industry sector, have local presences and are run by professional venture capitalists. Guarantees from all-risk guarantees whereby the Bank covers lenders against default regardless of the cause, to partial risk-specific contingent guarantees covering default arising from specified events. Generic products include debt guarantees, local currency loan guarantees and guarantees for trade facilitation. Assistance through financial intermediaries to support the development of micro, small and medium-sized enterprises (SMEs). Financial and operating leases for small businesses are available from EBRD-supported leasing facilities. EBRD SUSTAINABLE ENERGY INITIATIVE focuses on the following priorities: • Industrial energy efficiency • industrial energy efficiency in small and medium sized enterprises, small-scale renewable energy and building energy efficiency projects • Municipal infrastructure energy efficiency • Carbon market development • De-carbonising the power sector (energy efficiency and Renewable energy). • Climate risk management and adaptation.	Limited to Eastern Europe and with moderate risk level only
Equity	Marguerite fund	Background The Marguerite Fund is a financial instrument that has been launched by European public finance institutions including the EIB and the European Commission with the objective of supporting equity investment in greenfield (newly built) infrastructure projects in the EU. Marguerite invests in minority equity stakes of infrastructure project companies across three sectors: Trans	Very limited; financing usually only available for commercially viable projects

		European Networks – Transport, Trans European Networks – Energy and renewable energy. The fund started operations in 2010 and has signed eight transactions to date in the sectors of transport (road) and renewable energy (on-shore and off-shore wind farms, photo voltaic plants, waste to energy plant). The projects have long maturities linked to the economic life of the underlying assets. Marguerite is a commercially run fund managed by an independent team of investment professionals and is expected to deliver a return to its sponsors (investors). <u>Size</u> The Marguerite Fund has secured commitments of EUR 710 million from its sponsors including EUR 80 million from the European Commission. To date circa EUR 280 million has been allocated to the eight signed projects. The fund invests tickets of EUR 25 million to EUR 100 million in equity and quasi-equity (mezzanine, shareholder loans). <u>Technologies that could be financed</u> The Marguerite Fund is expected to invest up to 40% of available capital to sustainable renewable energy projects. The eligible renewable technologies include some of the technologies covered by the SET Plan such as wind (on-shore and off-shore), CSP and biogas. However the fund invests only in "bankable" project companies that generate robust revenue streams, usually secured by long-term contracts. Furthermore, it is managed on a commercial basis and is required to deliver a certain level of return to its investors. Therefore it cannot invest in projects that are exposed to technology risk (unproven technology). As a result the Marguerite Fund cannot most likely invest in the equity of the SET Plan First-Of-A-Kind projects.	
	Venture capital	Venture capital (particularly in Europe) will generally invest relatively small amounts of money and will expect that money to go into developing intellectual property and know-how, not infrastructure. Venture capital funds generally invest relatively small amounts of equity capital in companies. These investments tend to be in companies in their start-up or expansion phase that also require access to managerial expertise and networks. . Therefore it seems unlikely that they become a source of funds for large First-Of-A-Kind projects in energy infrastructure.	No, investments amounts too low
Insurance/re-insurance products		Insurance products can be used in certain limited circumstances to reduce project risks and so enhance investability. However, this is primarily applicable for risks with significant statistical data available and therefore not suited to support	Very limited in terms of risk taking. Potentially as a long term

		First-Of-A-Kind projects. There may be particular projects where insurance could play a role but this would be very specialised business undertaken by a limited number of insurance companies and assessed very much on a case by case basis.	investor.

Table 6. International financial instruments. Long description.

Instruments	Organisation	Main Characteristics	Suitable for First-Of-A-Kind SET Plan Projects
Loans and Guarantees	United States Department Of Energy loan programme	US DOE has 3 loan programs to spur investment in the same new technology sectors that the SET plan targets: • Loan Guarantee Program (§1703) to support innovative clean energy technologies that are typically unable to obtain conventional private financing due to high technology risks. USD 10.4 billion allocated. • ATVM Direct loans to support the development of advanced technology vehicles and associated components in the United States. Approx. USD 9.4 billion allocated. • Loan Guarantee Program (§1705) provides loan guarantees for U.S.-based projects and involve certain renewable energy systems, electric power transmission systems, and leading edge biofuels. Approx. USD 16 billion allocated Up to 80% of the loan can be assumed or guaranteed through these programs. Interest rates are determined by the cost to the US Treasury (AA) of incurring debt at the time of issuance.	Yes in principle, but not accessible for European projects
	IFC	IFC financial products include loans, guarantees, equity investments, and risk-sharing and venture capital funds. IFC partners actively with WB, EIB, and EBRD in development financing initiatives. Financial Products: • IFC loans: USD 1 million to USD 100 million from its own accounts, fixed and variable market rates, 7 to 12 year maturities typically, sometimes as long as 20 years, for early stage and expansion projects, as A-loans, usually limited to 25% of the project • Syndicated Loans: IFC acts as arranger and/or administrative agent, performs due	Yes in principle, although moderate risk levels. Not accessible to nuclear. Limited to Eastern Europe.

		diligence, and negotiates loan documents in cooperation with parallel lenders. B Loans: IFC sells participations in portions of its loans while remaining the lender of record for the entire amount meaning participants share in all project risks. • Equity Finance: IFC takes equity stakes in private sector companies and funds, usually for a period of 8 to 15 years, subscribing only 5 to 20% to encourage other investors. • IFC also invests through profit-participating loans, convertible loans, and preferred shares. • Structured Finance • Partial Credit Guarantees • Portfolio Risk-Sharing Facilities • Securitization IFC CleanTech Innovation Facility • The proposal is to create a Cleantech Innovation Facility (CTIF), a USD 60 million delegated authority facility that would include up to USD 15 million of concessional funding to invest equity or quasi-equity in early stage cleantech companies. Cleantech Venture Capital Fund • In Fall 2012, IFC investment in Cleantech venture capital was USD 190 million. Cleantech eligible sectors are those that are included in the SET Plan (excluding nuclear).	
	World Bank – Climate investments funds and climate technology fund	The World Bank is the trustee of the Climate Investment Funds. The CIF is a multi-donor platform governed by a separate (from the WB) oversight structure. Funds are disbursed through all of the multilateral development banks to support country-led programs and investments. • The CTF is one of two Trust Funds under the CIF. The funds are disbursed as grants, highly concessional loans, and/or risk mitigation instruments. • The CTF is intended to spur scale-up of low-carbon technologies. The eligible sectors are renewable energy, sustainable transport, and energy efficiency. • Public-private partnerships are key, as 37% of all funding is intended for the private sector, disbursed directly to real sector companies or through financial intermediaries.	Not applicable

		• As of March 2013, 41 projects have been approved for USD 2.3 billion in CTF funding, attracting an estimated USD 19.2 billion in co-financing. The total pledged is USD 6.5 billion. • Although Eastern Europe is included among the eligible recipient regions, there are no EU member countries on the list of potential recipients.	
	Asian Develoment bank (ADB)	• Partial credit guarantees of principal in favour of foreign and local commercial banks lending to solar power generation projects in India. This is not a first loss guarantee since banks will incur losses alongside any ADB claims paid • Eligible projects implemented by SPV, incorporated in India, to develop, construct, commission and operate solar power generation projects. • Limitation in terms of maximum share of a single lender in the facility with a maturity up to 15 years.	Yes in principle, but not accessible for European projects
Green Bonds	World Bank	The World Bank has issued about USD 3.5 billion in Green Bonds. Eligible projects include mitigation activities that fall in the same sectors/subsectors as the SET Plan activities (no nuclear). The World Bank frequently partners with IFC, EIB, and EBRD in development initiatives. Key aspects of the Green Bonds: • Green Bonds are a ”plain vanilla” fixed income product with standard financial features, including WB credit risk and preferred size of issuance. • Green Bond proceeds are ring-fenced to go to eligible projects identified in an aggregated portfolio. • In purchasing the bonds, investors accept the selection criteria and process the WB uses to define the aggregated portfolio—investors cannot select specific projects, countries, or sectors. • For project activities included in the aggregated portfolio, loan counterparts are national governments, or subnationals with sovereign guarantees • Terms of the bonds are based on the requirements (maturity, currency, etc) of the investor and the market conditions at the time of issuance. Note: IFC has also issued USD 2.2 billion in Green Bonds, administered like the IBRD Green Bond program (ring-fenced funds with an aggregated	Yes, in principle, but must be financially viable.

		portfolio of eligible projects selected by IFC).	

European Commission

EUR 26058 – Joint Research Centre – Institute for Energy and Transport

Title: Report on Innovative Financial Instruments for the Implementation of the SET Plan, First-Of-A-Kind projects

Authors: J. Burnham, O. Debande, O. Jones, C. Mihai, J. Moore, I. Temperton

JRC Coordination: J. Carlsson

Luxembourg: Publications Office of the European Union

2013– 35 pp. – 21.0 x 29.7 cm

EUR – Scientific and Technical Research series – ISSN 1831-9424 (online)

ISBN 978-92-79-32366-9 (online)

doi: 10.2790/89984

Abstract

This report responds to the request of Commissioner Oettinger and the Cabinet of Commissioner Geoghegan-Quinn made in the end of 2012, for an expert assessment and recommendations regarding the financing of first-of-a-kind commercial demonstration projects as prioritised in the roadmaps of the Strategic Energy Technology (SET) Plan. The expert group comprised representatives of financial organisations, i.e. the European Investment Bank, the European Venture Capital Association, the European Insurance and Re-insurance federation, the World Bank, and the Climate Change Capital. Six hearings with key stakeholders representing the SET Plan European Industrial Initiatives (EIIs), as well as the Fuel Cells and Hydrogen Joint Undertaking were held. These hearings provided information about main barriers to implementation and the gaps regarding access to finance. Existing EU financial instruments were evaluated too. The report concludes that a new financial instrument at EU level is not needed since existing financial instruments already provide equity, loans, or guarantees. However, until now, those instruments have not provided the financing required. As a response to that problem, this report presents a set of recommended changes to the existing financial instruments and their utilisation.

LD-NA-26058-EN-N

As the Commission's in-house science service, the Joint Research Centre's mission is to provide EU policies with independent, evidence-based scientific and technical support throughout the whole policy cycle.

Working in close cooperation with policy Directorates-General, the JRC addresses key societal challenges while stimulating innovation through developing new standards, methods and tools, and sharing and transferring its know-how to the Member States and international community.

Key policy areas include: environment and climate change; energy and transport; agriculture and food security; health and consumer protection; information society and digital agenda; safety and security including nuclear; all supported through a cross-cutting and multi-disciplinary approach.

Publications Office

ISBN 978-92-79-32366-9